AIR QUALITY PERMIT

Issued to: Holcim (US) Inc.
Trident Facility
4070 Trident Road
Three Forks, MT 59752

Permit: #0982-11
Application Received: 10/03/01
Application Complete: 02/12/03
Preliminary Determination Issued: 03/24/03
Supplementary Preliminary Determination Issued: Date of DEIS
Department Decision Issued:
Permit Final:
AFS #031-0005

An air quality permit, with conditions, is hereby granted to Holcim (US) Inc. (Holcim) pursuant to Sections 75-2-204, 211, and 215 of the Montana Code Annotated (MCA), as amended, and the Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

Section I: Permitted Facilities

A. Plant Location

The Holcim cement manufacturing facility is located near the headwaters of the Missouri River in the Northeast ¼ of Section 9, Southeast ¼ of Section 4, Southwest ¼ of Section 3, and Northwest ¼ of Section 10, Township 2 North, Range 2 East, approximately 5 miles northeast of Three Forks in Gallatin County, Montana.

B. Current Permit Action

On October 3, 2001, Holcim submitted to the Montana Department of Environmental Quality (Department) an application for a modification to Montana Air Quality Permit #0982-10. The permit application requested that the mid-kiln combustion of whole tires be added to the list of potential fuels for the facility. The tires would comprise up to 15 percent of the total fuel heat input to the kiln on a British thermal unit (Btu) basis. Holcim is currently authorized to burn natural gas, coal, petroleum coke, or any combination of these fuels in the kiln. This project would entail some limited modification to the kiln shell and would require additional miscellaneous equipment to handle and store tires at the facility. Since Holcim applied for a solid waste incineration permit under 75-2-215, MCA, a human health risk assessment was required with the air quality application in accordance with ARM 17.8.770. In addition, analysis by Holcim determined that carbon monoxide (CO) emissions could potentially increase above the Prevention of Significant Deterioration (PSD) significance threshold; therefore, the PSD program applies and an emission limit was established for CO. The current permit action also changes the name on the permit from Holnam, Inc. to Holcim. The Department received the request for the name change on November 14, 2001. According to that letter, the change became effective on December 12, 2001. After Holcim's submittal of additional supporting information, the Department deemed the application to be complete on February 12, 2003.

On March 24, 2003, the Department issued a Preliminary Determination (PD) and draft Environmental Assessment (EA). On August 15, 2003, the Department issued a Final EA recommending that an Environmental Impact Statement (EIS) be completed for the project. The Montana Environmental Policy Act (MEPA) requires that a cumulative impact analysis be conducted before a decision can be made on the permit application. The Department determined that the preparation of an EIS would generate the information necessary to conduct this analysis. Therefore, an EIS was completed for this project. A complete list of the permitted equipment and additional project details are contained in the permit analysis.

Section II: Conditions and Limitations

A. Emission Control Requirements

Holcim shall install, operate, and maintain the following emission control equipment and practices.

1. Holcim shall operate and maintain baghouse(s) to control emissions from the Finish Mill #2 sources listed below (ARM 17.8.752).

    a. The air slide
    b. The clinker/gypsum feed belt via a booster fan
    c. The Finish Mill #2
    d. The bucket elevator
    e. The product separator

2. Holcim shall operate and maintain baghouse(s) to control emissions from the following coal and coke handling equipment (ARM 17.8.752).

    a. Screw conveyor from the coal/coke/crusher to the bucket elevator
    b. "Raw" coke storage silo
    c. Coke storage silo
    d. Two diverter valves
    e. Hammer mill
    f. Bucket elevator
    g. Coal storage silo
    h. Belt conveyor with weighing system at the base of the “raw” coke storage silo
    i. Coke grinding mill
    j. “Fine” coke storage silo (220-ton)

3. Holcim shall operate and maintain an electrostatic precipitator (ESP) and use proper design and combustion practices to control kiln emissions (ARM 17.8.752).

4. Holcim shall operate and maintain a baghouse to control clinker cooler emissions (ARM 17.8.749).

5. Holcim shall operate and maintain baghouse(s) to control emissions from the rock silos (ARM 17.8.749).

6. Holcim shall operate and maintain baghouse(s) to control emissions from crushing and screening (ARM 17.8.749).

7. Holcim shall operate and maintain a baghouse to control emissions at the clinker belt conveyor (ARM 17.8.749).

8. Holcim shall operate and maintain a baghouse to control emissions at the dustbin near the precipitator (ARM 17.8.749).

9. Holcim shall operate and maintain a baghouse to control emissions from the Portland cement silos (ARM 17.8.749).

10. Holcim shall operate and maintain a baghouse to control emissions from the Finish Mill #4 system (ARM 17.8.749).

11. Holcim shall operate, and maintain a baghouse to control emissions from the pozzolan material storage silo (ARM 17.8.752).

12. Holcim shall use and maintain enclosures around the pozzolan material system components listed below (ARM 17.8.752).

    a. Rotary feeder
    b. Weigh-belt conveyor
    c. Screw line (conveyor)

13. Holcim shall use water spray, as necessary, to maintain compliance with the opacity limitation in Section II.C.14 when handling landfilled cement kiln dust (CKD) (ARM 17.8.752).

14. Whenever process equipment is operating, Holcim shall use and maintain, as they were intended, conveyor covers, transfer point covers, or structural enclosures surrounding process equipment (ARM 17.8.749).

B. Operational Limitations

1. In the cement kiln, Holcim is authorized to burn up to 100% natural gas, up to 100% coal, up to 100% coke, up to 15% whole tires, or any combination of these fuels within the previously stated limits (ARM 17.8.749).

2. Holcim shall comply with the sulfur in fuel rule (ARM 17.8.322).

3. Holcim shall not use more than 50,000 tons of pozzolan material during any rolling 12-month time period (ARM 17.8.752).

4. The amount of post-consumer recycled container glass used by Holcim in the cement kiln is limited to 800 tons during any rolling 12-month time period (ARM 17.8.752).

5. Holcim shall not handle more than 85,000 tons of landfilled CKD during any rolling 12-month time period (ARM 17.8.752).

6. Holcim shall limit kiln production to 425,000 tons of clinker during any rolling 12-month time period (ARM 17.8.749).

7. Holcim shall limit clinker handling to 500,000 tons during any rolling 12-month time period (ARM 17.8.749).

8. Holcim shall combust only passenger and/or light truck tires as the tire-derived supplemental fuel for the kiln (ARM 17.8.749).

9. Holcim shall not combust tires in an amount that exceeds 15% of the total fuel heat input to the kiln (measured on a Btu basis) during any rolling 12-month time period (ARM 17.8.749).

10. Holcim shall not insert more than two tires into the kiln per kiln revolution (ARM 17.8.749).

11. Holcim shall not combust more than 1,137,539 tires during any rolling 12-month time period (ARM 17.8.749).

12. While tires are being combusted in the kiln, Holcim shall maintain the hourly average burning zone temperature of the kiln above 2,100 degrees Fahrenheit (°F). The burning zone temperature of 2,100° F shall be maintained for 30 minutes after the insertion of tires has stopped, unless a power surge, fuel feed malfunction, main drive failure, induced draft (ID) fan failure, or slurry feed failure prevents Holcim from maintaining this temperature. The burning zone temperature of the kiln shall be continuously monitored and recorded (ARM 17.8.749 and ARM 17.8.752).

13. In the event of an upset or malfunction of the air pollution control device for the kiln main stack that lasts 15 minutes or more, Holcim shall discontinue the insertion of tires into the kiln until the upset or malfunction condition is corrected and the air pollution control device for the kiln is functioning (ARM 17.8.749).

14. Holcim is authorized to use iron ore and ASARCO slag in the cement kiln. Holcim shall not use any other iron source without prior written approval from the Department (ARM 17.8.749).

15. Holcim shall limit the amount of ASARCO slag used in the cement kiln to 16,535 tons (15,000 metric tons) during any rolling 12-month time period (ARM 17.8.749).

C. Emission Limitations

1. Holcim shall not cause or authorize to be discharged into the atmosphere from the kiln, any stack emissions that:

   a. Contain particulate matter in excess of 0.77 pounds per ton (lb/ton) of clinker produced (ARM 17.8.749 and ARM 17.8.752).

   b. Contain oxides of nitrogen (NO_x) emissions in excess of 1,568 pounds per hour (lb/hr) averaged over any rolling 30-day period, calculated from seven a.m. to seven a.m. on a daily basis (ARM 17.8.749 and November 16, 2001, Board of Environmental Review (Board) Order).

   c. Contain sulfur dioxide (SO_2) emissions in excess of 124 lb/hr averaged over any rolling 30-day time period, calculated from seven a.m. to seven a.m. on a daily basis (ARM 17.8.749 and November 16, 2001, Board Order).

   d. Contain dioxins and furans in excess of 0.20 nanograms per dry standard cubic meter (ng per dscm) ($8.7x10^{-11}$ grains per dry standard cubic foot (gr per dscf)) (toxicity equivalents (TEQ)) corrected to 7% oxygen, or dioxins and furans in excess of 0.40 ng per dscm ($1.7x10^{-10}$ gr per dscf) (TEQ) corrected to 7% oxygen, when the average of the performance test run average temperatures at the inlet to the particulate matter control device is 204 degrees Celsius °C (400° F) or less (40 CFR 63.1343 and ARM 17.8.342).

   e. Contain VOC in excess of 2.25 lb/hr (ARM 17.8.749 and ARM 17.8.752).

   f. Exhibit an opacity of 20% or greater averaged over 6 consecutive minutes. Compliance with this condition shall be based on the data from the continuous opacity monitoring system (COMS) (ARM 17.8.749).

2. Once tires are combusted in the kiln, Holcim shall limit the hours of operation, the capacity, the emission rate, and/or the fuel consumption of the kiln such that the CO emissions from the kiln do not exceed 310 tons during any rolling 12-month time period. Any calculations used to establish CO emissions shall be approved by the Department in writing and shall be based on the CO emissions measured by the CO continuous emission monitoring system (CEMS) for the kiln, unless otherwise approved by the Department in writing (ARM 17.8.752).

3. Holcim shall not cause or authorize to be discharged into the atmosphere from the burning of tires in the kiln, emissions that contain:

   a. Arsenic (As) in excess of 7.15×10^{-5} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   b. Beryllium (Be) in excess of 8.17×10^{-6} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   c. Cadmium (Cd) in excess of 5.01×10^{-4} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   d. Total Chromium (Cr) in excess of 1.09×10^{-5} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   e. Dioxins and furans in excess of 6.00×10^{-9} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   f. Lead (Pb) in excess of 4.68×10^{-3} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   g. Manganese (Mn) in excess of 3.16×10^{-2} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   h. Mercury (Hg) in excess of 3.99×10^{-3} lb/hr (ARM 17.8.749 and ARM 17.8.752).

   I. Total Polycyclic Aromatic Hydrocarbons (PAH) in excess of 1.89×10^{-2} lb/hr (ARM 17.8.749 and ARM 17.8.752).

4. Holcim shall not cause or authorize to be discharged into the atmosphere any visible fugitive emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.308).

5. Holcim shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308(2)).

6. Holcim shall treat all unpaved portions of the haul roads, access roads, parking lots, and the general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precaution limitation in Section II.C.5 (ARM 17.8.749).

7. Holcim shall not cause or authorize to be discharged into the atmosphere visible emissions from any source installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304(1)).

8. Holcim shall not cause or authorize to be discharged into the atmosphere visible emissions from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304(2)).

9. Holcim shall not cause or authorize the following to be discharged into the atmosphere, from the Finish Mill #2 baghouse:

    a. Particulate matter in excess of 0.02 gr/dscf (ARM 17.8.752); and

    b. Visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (40 CFR Part 60, Subpart F and ARM 17.8.340).

10. Holcim shall not cause or authorize the following to be discharged into the atmosphere from the Dixie Mill baghouse(s):

    a. Particulate matter in excess of 0.02 gr/dscf (ARM 17.8.752); and

    b. Visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (40 CFR Part 60, Subpart F and ARM 17.8.340).

11. Holcim shall not cause or authorize the following to be discharged into the atmosphere from the coke system baghouse:

    a. Particulate matter in excess of 0.02 gr/dscf (ARM 17.8.752); and

    b. Visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (40 CFR Part 60, Subpart F and ARM 17.8.340).

12. Holcim shall not cause or authorize the following to be discharged into the atmosphere from the pozzolan material silo baghouse (ARM 17.8.752):

    a. Particulate matter in excess of 0.02 gr/dscf; and

    b. Visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

13. Holcim shall comply with all applicable requirements of ARM 17.8.340, which references 40 CFR Part 60, Standards of Performance for New Stationary Sources.

    a. Subpart F, Standards of Performance for Portland Cement Plants, applies to sources at Holcim including, but not limited to, the following:

        i. Finish Mill #2;
        ii. Finish Mill #4; and
        iii. Storage Silos #26 through 30.

    b. Holcim shall not cause or authorize to be discharged into the atmosphere from the Finish Mill #4 visible emissions that exhibit 10% opacity or greater (40 CFR Part 60, Subpart F and ARM 17.8.340).

    c. Holcim shall not cause or authorize to be discharged into the atmosphere from Storage Silos #26 through 30 visible emissions that exhibit 10% opacity or greater (40 CFR Part 60, Subpart F and ARM 17.8.340).

14. Holcim shall not cause or authorize to be discharged into the atmosphere visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes when handling landfilled CKD (ARM 17.8.749).

15. Holcim shall comply with all applicable provisions of 40 CFR 63, Subpart LLL, National Emission Standards for Hazardous Air Pollutants (NESHAP) from the Portland Cement Manufacturing Industry. The Holcim Trident facility was designated an area source for the purposes of determining the applicability of Portland Cement Maximum Achievable Control Technology (PC MACT) (40 CFR 63, Subpart LLL and ARM 17.8.342).

D. Testing Requirements

1. Holcim shall conduct performance source tests on the kiln to determine compliance with the applicable particulate emission limit in Section II.C.1.a at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

2. Holcim shall use the data from the NO_x and SO_2 CEMS to monitor compliance with the NO_x and SO_2 emission limits in Section II.C.1.b and II.C.1.c (ARM 17.8.749 and November 16, 2001, Board Order).

3. Holcim shall use data from the CO CEMS to monitor compliance with the CO emission limit in Section II.C.2 (ARM 17.8.749).

4. Holcim shall use the data from the COMS to monitor compliance with the opacity limit contained in Section II.C.1.f. In the event the COMS is not operational, Holcim shall use visible emission observations to assess compliance with the opacity limit in Section II.C.1.f (ARM 17.8.749).

5. Holcim shall monitor compliance with the limit in Section II.C.1.d and the PC MACT dioxin and furans emission limits contained in 40 CFR 63, Subpart LLL, by conducting source tests on the kiln for dioxins and furans. The source tests shall be conducted under conditions representative of Holcim's maximum operating conditions and shall be conducted in accordance with the methodology described in 40 CFR 63, Subpart LLL. Holcim shall conduct these compliance source testing demonstrations for the kiln at least once every 30 months, unless otherwise approved by the Department in writing (ARM 17.8.105, ARM 17.8.749, and 40 CFR 63, Subpart LLL).

6. Within 180 days after Holcim first burns tires as a fuel in the kiln, Holcim shall conduct a source test on the kiln for VOC to demonstrate compliance with the limit in Section II.C.1.e and the PC MACT area source determination. The source test shall be conducted under conditions representative of Holcim's maximum operating conditions using tires as a fuel and according to an EPA approved method or according to another test method approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

7. Without using tires as a fuel in the kiln, Holcim shall conduct a source test on the kiln for As, Be, Cd, Cr (total), dioxins and furans, Pb, Mn, Hg, and PAH (total) to establish baseline emissions for these pollutants. The source test shall be conducted under conditions representative of Holcim's maximum operating conditions without using tires as a fuel and according to an EPA approved method or according to another test method approved by the Department in writing. Additional baseline source testing demonstrations for the kiln shall occur at least once per year thereafter or according to another testing/monitoring schedule as may be approved by the Department in writing. After three source tests have been performed to show a representative baseline, Holcim may request a review of the testing frequency (ARM 17.8.105 and ARM 17.8.749).

8. Within 180 days after Holcim first burns tires as a fuel in the kiln, Holcim shall conduct a source test on the kiln for As, Be, Cd, Cr (total), dioxins and furans, Pb, Mn, Hg, and PAH (total). The source test shall be conducted under conditions representative of Holcim's maximum operating conditions using tires as a fuel and according to an EPA approved method or according to another test method approved by the Department in writing. The measured emissions from the baseline testing required by Section II.D.7 shall be subtracted from the measured emissions while using tires as part of the fuel mixture, and the difference in emissions shall be used to monitor compliance with the As, Be, Cd, Cr (total), dioxins and furans, Pb, Mn, Hg, and PAH (total) limits in Section II.C.3. Additional compliance source testing demonstrations for the kiln shall occur at least once per year thereafter or according to another testing/monitoring schedule as may be approved by the Department in writing. After three consecutive source tests have been performed that demonstrate compliance with the permit limits, Holcim may request a review of the testing frequency (ARM 17.8.105 and ARM 17.8.749).

9. Holcim shall conduct visible emission observations to assess compliance with the opacity limit in Section II.C.9 for the Finish Mill #2 baghouse at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.340).

10. Holcim shall conduct particulate performance source tests on the Finish Mill #2 baghouse to determine compliance with the applicable particulate emission limit in Section II.C.9 at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105, ARM 17.8.749, and ARM 17.8.340).

11. Holcim shall conduct visible emission observations to assess compliance with the opacity limit in Section II.C.10 for the Dixie Mill baghouse at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

12. Holcim shall conduct particulate performance source tests on the Dixie Mill baghouse to determine compliance with the applicable particulate emission limit in Section II.C.10 at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

13. Holcim shall conduct visible emission observations to assess compliance with the opacity limit in Section II.C.11 for the coke system baghouse at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

14. Holcim shall conduct particulate performance source tests on the coke system baghouse to determine compliance with the applicable particulate emission limit in Section II.C.11 at least once every 5 years or according to another testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

15. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

16. The Department may require further testing (ARM 17.8.105).

E. Continuous Monitoring System Requirements

1. Holcim shall install, operate, calibrate, and maintain the following:

   a. A CEMS for the measurement of SO_2 from the kiln stack (ARM 17.8.749 and November 16, 2001, Board Order).

   b. A CEMS for the measurement of NO_x from the kiln stack (ARM 17.8.749 and November 16, 2001, Board Order).

   c. A CEMS for the measurement of CO from the kiln stack. Within 180 days after Holcim first burns tires as a fuel in the kiln, Holcim shall install and calibrate the CO CEMS (ARM 17.8.749).

   d. A COMS for the measurement of opacity from the kiln stack. Within 180 days after Holcim first burns tires as a fuel in the kiln, Holcim shall install and calibrate the COMS (ARM 17.8.749).

   e. A flow monitoring system for the measurement of the volumetric flowrate from the kiln stack (ARM 17.8.749).

   f. A temperature monitoring system for the measurement of the burning zone temperature of the kiln (ARM 17.8.749).

2. All continuous monitors required by this permit shall be operated, excess emissions reported, and performance tests conducted in accordance with the requirements of 40 CFR Part 60, Appendix B (Performance Specifications #1, #2, #4, #4a, and #6) (ARM 17.8.749 and November 16, 2001, Board Order).

3. On-going quality assurance requirements for the CEMS must conform to 40 CFR Part 60, Appendix F (ARM 17.8.749).

4. Holcim shall inspect and audit the COMS annually. Holcim shall conduct these audits using the appropriate procedures contained in the performance specifications contained in 40 CFR 60, Appendix B (Performance Specification #1), and approved by the Department in writing (ARM 17.8.749).

5. Holcim shall maintain on site records of all measurements from the CEMS: CEMS performance testing measurements; CEMS performance evaluations; CEMS calibration checks and audits; and, any adjustments or maintenance performed on the CEMS. The records shall be retained on site for at least 5 years following the date of such measurements and reports. Holcim shall supply these records to the Department upon request (ARM 17.8.749).

6. Holcim shall provide to the Department reports from the NO_x, SO_2, and CO CEMS that conform to 40 CFR Section 60.7 (c). Holcim shall provide these reports on a quarterly basis for the first year after the CEMS are operating and the performance specification procedures have been approved in writing by the Department and semiannually thereafter (ARM 17.8.749 and November 16, 2001, Board Order).

7. Holcim shall maintain on site records of all measurements from the COMS, COMS performance testing measurements, COMS performance evaluations, COMS calibration checks and audits, and any adjustments or maintenance performed on the COMS. The records shall be retained on site for at least 5 years following the date of such measurements and reports. Holcim shall supply these records to the Department upon request (ARM 17.8.749).

8. Holcim shall maintain on site records of all calibration checks, audits, and adjustments or maintenance performed on the flow monitoring and temperature monitoring systems required in Section II.E.1.e and Section II.E.1.f (ARM 17.8.749).

F. Operational Reporting Requirements

1. Holcim shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but will not be limited to, all sources of emissions identified in the permit analysis. Production information must be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information must be in the units required by the Department. This information may be used for calculating operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations. Holcim shall submit the following information annually to the Department by March 1 of each year (ARM 17.8.505):

   a. the total tons of pozzolan material used;
   b. the amount of post-consumer recycled container glass used in the kiln;
   c. the amount of CKD excavated;
   d. the amount of clinker produced in the kiln;
   e. the amount of clinker handled;
   f. the number of tires used as fuel in the kiln; and
   g. the amount of ASARCO slag used in the kiln.

   This information may be submitted along with the annual emission inventory.

2. Holcim shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

3. Holcim shall document, by month, the amount of pozzolan material used in the pozzolan material system. By the 25th day of each month, Holcim shall total the amount of pozzolan material used for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.3. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

4. Holcim shall document, by month, the amount of post-consumer recycled container glass used in the kiln. By the 25th day of each month, Holcim shall total the amount of recycled glass used for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.4. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. Holcim shall document, by month, the amount of landfilled CKD handled. By the 25th day of each month, Holcim shall total the amount of CKD handled during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.5. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. Holcim shall document, by month, the amount of clinker produced. By the 25th day of each month, Holcim shall total the amount of clinker production during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.6. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

7. Holcim shall document, by month, the amount of clinker handling. By the 25th day of each month, Holcim shall total the amount of clinker handling during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.7. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

8. Holcim shall document, by day, the percentage of total fuel heat input that is provided to the kiln by the combustion of tires. By the 25th day of each month, Holcim shall total the percentage of total fuel heat input that was provided to the kiln by the combustion of tires during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.9. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

9. Holcim shall document, by month, the number of tires placed in the kiln for combustion. By the 25th day of each month, Holcim shall total the number of tires placed in the kiln during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.11. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

10. By the 25th day of each month, Holcim shall document the hourly average burning zone temperatures for the previous month. The monthly information will be used to verify compliance with the limitation in Section II.B.12. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

11. Holcim shall document the use of tires as a supplemental fuel source for the kiln during upset or malfunction conditions to monitor compliance with Section II.B.13. The records must include, but are not limited to, the date and time of the upset, type or category of upset, the duration of the upset, a description of whether or not the tires were removed from the feed and, if so, when they were removed, and when the tires were re-inserted (ARM 17.8.749).

12. Holcim shall document, by month, the amount of ASARCO slag used in the kiln. By the 25th day of each month, Holcim shall total the amount of ASARCO slag used for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.B.15. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

13. Holcim shall document, by month, the amount of CO emissions from the kiln. By the 25th day of each month, Holcim shall total the CO emission from the kiln during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.C.2. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

14. Holcim shall document that conveyor covers, transfer point covers, or structural enclosures surrounding process equipment were maintained and in place during operation of process equipment. The records shall include all repair and maintenance activity to all conveyor covers, transfer point covers, or structural enclosures. The records must include, but are not limited to, the date, time, and action(s) taken for repair and maintenance (ARM 17.8.749).

15. All records compiled in accordance with this permit must be maintained by Holcim as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

Notification

1. Holcim shall provide the Department with the general engineering design specifications and a brief overview and discussion of the gate used to drop tires into the kiln in writing at least 15 days prior to commencement of construction of the kiln modification (ARM 17.8.749).

2. Holcim shall notify the Department within 24 hours after first using tires as a fuel for the kiln and provide written notification within 7 days after first using tires as a fuel for the kiln (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – Holcim shall allow the Department's representatives access to the source at all times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, COMS, and CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if Holcim fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Holcim of the responsibility for complying with any applicable federal or Montana statute, rule or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, *et seq.*, MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board. A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by Department personnel at the location of the permitted source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Holcim may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years after permit issuance and proceed with due diligence until the project is complete or Permit #0982-11 shall expire. If the permit expires, Holcim shall not commence construction until Holcim has applied for and received a new air quality permit pursuant to Sections 75-204, 75-2-211, and 75-2-215, MCA, and ARM 17.8.740, et seq., as amended (ARM 17.8.762).

PERMIT ANALYSIS
Holcim (US) Inc.
Permit #0982-11

I. Introduction/Process Description

A. Permitted Equipment

Holcim (US) Inc. (Holcim) operates the following equipment at the Trident facility located in the Northeast ¼ of Section 9, Southeast ¼ of Section 4, Southwest ¼ of Section 3, and Northwest ¼ of Section 10, Township 2 North, Range 2 East, approximately 5 miles northeast of Three Forks in Gallatin County, Montana.

Source Description	Control Equipment	Efficiency
Disturbed Area – Fugitive	None	NA
Drilling	None	NA
Blasting	None	NA
Limestone, Sand, Shale Removal	None	NA
Transfer, Conveying, and Screening	None	NA
Raw Material Storage Piles	None	NA
Haul Roads – Fugitives	Dust suppression	85%
Primary Crusher	Fabric filter	99%
Crusher Screen	Fabric filter	99%
Raw Material Silo #1	Fabric filter	99%
Raw Material Silos #2 and 3	Fabric filter	99%
Raw Material Silos #4 and 5	Fabric filter	99%
Raw Material Silos #6 and 7	Fabric filter	99%
Coal/Coke Unload Fugitive	None	NA
Coal/Coke Transfer Handling Fugitive	None	NA
Coal Outside Storage Pile	None	NA
Coke Outside Storage Pile	None	NA
Coal Crusher	Fabric filter	99%
Coal Silo – Loading	Fabric filter	99%
Coal Silo - Unloading	Fabric filter	99%
Fluid Coke Silo – Loading	None	NA
Fluid Coke Silo Unloading	None	NA
Kiln	ESP	99.4%
Clinker Cooler	Fabric filter	99.8%
Inside Clinker Transfer	Fabric filter	99.8%
Gypsum/Clinker Storage Silo	Fabric filter	99%
Cement Kiln Dust (CKD) Storage Load	Fabric filter	99%
CKD Storage Unloading	Dust suppression	50%
Emergency Clinker Bins Loading	Fabric filter	99%
Emergency Clinker Storage Silo 1	None	NA
Emergency Clinker Storage Silo 2	None	NA
Emergency Clinker Storage Silo 3	None	NA
Emergency Clinker Storage Silo 4	None	NA
#2 Finish Mill	Fabric filter	99%
Clinker Transfer #2 Finish Mill	Fabric filter	99%
#3 Finish Mill Transfer	Fabric filter	99%
#3 Finish Mill	Fabric filter	99%
Clinker Transfer #4 Finish Mill	Fabric filter	99%
#4 Finish Mill Product Separator	Fabric filter	99.8%
#4 Finish Mill Vent	Fabric filter	99.8%
Finish Mill Materials Unloading System	Fabric Filter	98%
Masonry Storage Bins 1- 3	Fabric filter	95%
Cement Storage Silos 4 – 5	Fabric filter	99%
Cement Sack Machine #1	Fabric filter	98%
Cement Sack Machine #2	Fabric filter	98%
Cement Sack Machine #3	Fabric filter	98%
Cement Sack Machine #4	Fabric filter	98%
Cement Silos 1-7, 10, 11, 13	Fabric filter	99%
Cement Silos #8, 9, 12	Fabric filter	99%
Cement Transfer 1-13 to Bulk	Fabric filter	99%

Source Description	Control Equipment	Efficiency
Cement Storage Silo 14-25	Fabric filter	99%
Cement Storage Silo 26-30	Fabric filter	99%
Bulk Cement Transfer and Truck Loadout 1	Fabric filter	99%
Bulk Cement Transfer and Truck Loadout 2	Fabric filter	99%
Bulk Cement Rail Car Loadout	Fabric filter	99%
Diesel Fuel	None	NA
Gasoline	None	NA
Pozzolan Material Storage Silo	Fabric filter	99%
Rotary Feeder	Fabric filter	95%
Weighbelt Conveyor	Fabric filter	95%
Screw Line (conveyor)	Fabric filter	95%
Handling Landfilled CKD	Water spray	50%
Waste Oil Burner	None	NA

B. Facility Description

Holcim operates the Trident Portland cement manufacturing plant near Three Forks, Montana. The facility operates 24 hours per day and 365 days per year, with periods of routine maintenance. Raw materials, such as limestone, shale, and sandstone, are mined at the Trident site. Raw materials are mined or purchased, crushed, screened, and stored on-site in dedicated silos.

Measured amounts of each material are conveyed to the raw materials mill where water is added and the mixture is pulverized to a "fine" slurry. The slurry is sent to the kiln, where clinker is produced. Clinker is then sent to the clinker cooler and cooled from approximately 2,500 degrees Fahrenheit (° F) to 150° F and then transferred to storage silos or alternative storage sites if the silos are full. Clinker is mixed with 5% gypsum and pulverized to produce Portland cement. The cement enters a high efficiency air separator and is sent to a dust collector. Cement from the dust collector is sent to a cement cooler via an air slide and the cooled cement is then pneumatically conveyed to onsite cement storage silos.

C. Permit History

On April 27, 1971, the Ideal Cement Company received **Permit** #**282-072171**. This permit approved the construction of 10 pieces of control equipment, as follows:

1. An electrostatic precipitator to control kiln emissions sized for 300,000 cubic feet per minute (cfm) @ 700 °F, 15 grains per actual cubic feet perm minute (gr/acfm) inlet, 0.15 gr/acfm outlet, and 99.9% efficiency.

2. A pulsejet type baghouse to control clinker cooler emissions sized for 100,000 cfm @ 350 °F, 8.3: 1 air/cloth ratio, and Nomex bags.

3. Four Micro-pulsaire dust collectors on the rock silos as follows:

   A total of two @ 7.4:1 air/cloth ratio, 843 square feet (ft^2) cloth area, Model IF124
   A total of two @ 7.8:1 air/cloth ratio, 670 ft^2 cloth area

4. Two Micro-pulsaire dust collectors to control emissions from crushing and screening as follows:

   Crushing – Micro-pulsaire model IFI-48, 7200-cfm capacity fan
   Screening – Micro-pulsaire model IFI-24, 6400-cfm capacity fan

5. One small baghouse to control emissions at the clinker belt conveyor.

6. One small baghouse to control emissions at the dustbin near the precipitator.

On May 3, 1971, the Ideal Cement Company received **Permit #293-080471** to construct five pieces of equipment.

1. Primary Crusher, 450 tons per hour
2. Vibrating Screen, 6 ft x 12 ft, Missouri-Rodgers
3. Raw Mill, 11 ft x 34 ft, Bawl Mill, 2,000 hp, F.L. Smith
4. Kiln, 12 ft x 450 ft, Wet Process Rotary Kiln, F.L. Smith, 400 hp, kiln draft fan
5. Clinker Cooler, Folax Grates, F.L. Smith

Commitments to the construction of this equipment were made prior to August 17, 1971, so the equipment is not subject to 40 CFR 60, Subpart F, Standards of Performance for Portland Cement Plants.

On April 16, 1975, the Ideal Cement Company was issued **Permit #811-050475** to combust coal in the cement kiln.

On July 19, 1976, Ideal Basic Industries was issued **Permit #982** to construct four Portland cement storage silos. These silos were controlled by a baghouse.

On January 6, 1984, a modification to **Permit #811-050475** was issued to Ideal Basic Industries, that allowed the gas/coal-fired cement kiln to burn a coal (75%)/coke (25%) combination fuel. However, as a result of increases in oxides of nitrogen (NO_x) emissions observed from the August 1983 source tests, the Montana Department of Health and Environmental Sciences issued a letter on January 9, 1984, that stated they would grant a permit modification only if there were no increases in emissions. Therefore, additional NO_x source testing was completed in June and August of 1985 and July of 1986. Results of the July, 1986 testing showed that a major permit modification was not required. On June 25, 1986, an application was submitted from Ideal Basic Industries to burn up to 50% coke, but a permit was not issued.

On August 9, 1990, Holnam submitted Permit Application #0982-01 for the use of alternative fuels in the cement kiln. **Permit application #0982-01** was withdrawn.

On November 22, 1993, Holnam submitted Permit Application #0982-02 for the replacement of sections of the cement kiln. The changes proposed in the application were determined to be maintenance and did not require a permit change. **Permit application #0982-02** was withdrawn.

Permit #0982-03 was issued to Holnam on July 29, 1995. Holnam proposed to upgrade the existing cement Finish Mill #2 baghouse to a modern baghouse; replace the Finish Mill #2 air slide; replace two existing dust collectors on the coal/coke process with one unit; and construct a separate coke grinding, storage, and transport system with dust collection. The Finish Mill #2 baghouse, which replaced an existing baghouse, controlled the emission units listed below.

1. A replacement air slide
2. The clinker/gypsum feed belt via a booster fan
3. The Finish Mill #2
4. The bucket elevator
5. The product separator

The air slide which was totally enclosed and necessary for the transport of cement from the elevator to the product separator (air separator) was replaced along with two existing dust collectors on the coal/coke baghouse which controlled the equipment listed below.

1. A diverter valve at the top of the existing coal/coke storage silo
2. A 24-inch covered screw conveyor that transports the coke from the above diverter valve
3. A 290-ton "raw" coke storage silo
4. Two diverter valves
5. The hammermill
6. The bucket elevator
7. The coal/coke storage silo
8. The covered screw conveyor

The separate coke system transported coke on the existing path up to the point of delivery into the top of the coal/coke storage silo. At this point, the system incorporated a gate that discharged into a 290-ton capacity "raw" coke storage silo. Coal was diverted into the existing coal/coke storage silo. The proposed raw coke storage silo gravity fed onto a covered belt assembly, where the material was weighed before it was gravity fed into the coke-grinding mill. The ground coke fines were then evacuated from the coke-grinding mill via a 15,400-cfm fan that pneumatically transported the crushed coke to the proposed coke system baghouse where the gas and solid phases were separated. The ground "fine" coke material discharged from this dust collector into a 220-ton "fine" coke storage silo. Pneumatic transport of the fine coke particles from this silo to the kiln hood was facilitated by a coke blower system. The proposed coke system baghouse and fan controlled the equipment listed below.

1. A belt conveyor with weighing system at the base of the raw coke storage silo
2. A coke grinding mill
3. A 220-ton "fine" coke storage silo

The emission increase as a result of the changes was estimated at 10.84 tons/year of particulate matter.

On March 30, 1998, Holnam submitted a complete permit application proposing a pozzolan material (fly ash) system that included the following new equipment: pozzolan material storage silo with bin vent dust collector, rotary feeder, weighbelt conveyor, and screw line (conveyor). Holnam intended to introduce pozzolan material at the finish mill to produce Holnam Performance Cement (HPC). Controlled particulate matter under 10 microns (PM_{10}) emissions from the equipment were approximately 2.10 tons per year. The permit also updated the permit with current rule references. Permit #0982-03 had included conditions from Permits #282-072171, #293-080471, #811-050475, #982, and Modification #811-050475. Therefore, Permit #0982-04 also replaced these permits. **Permit #0982-04** replaced Permit #0982-03.

On April 29, 1998, Holnam submitted a modification request to allow Holnam to conduct a test burn that exceeded the operational limit to burn up to 25% petroleum coke. The amount of petroleum coke burned in the kiln was limited so that 15 tons per year of sulfur dioxide (SO_2) was not exceeded; therefore, this test burn was completed according to the Administrative Rules of Montana (ARM) 17.8.705(1)(q). However, as described in ARM 17.8.733(1)(c), the permit needed to be modified to allow the temporary burning of petroleum coke in excess of the permitted limitation. Holnam was required to comply with the sulfur-in-fuel requirements contained in ARM 17.8.322(6)(c) and to maintain records to demonstrate compliance with the petroleum coke limitation in Section II.F.1.b of Permit #0982-05. In addition, testing was required to determine emissions at the maximum rate of petroleum coke burned. **Permit #0982-05** replaced Permit #0982-04.

The Department received notification that test burning began on November 14, 1999, and concluded on November 14, 2000. Coke test burn air emission source testing was conducted November 1 through 14, 2000.

On December 12, 1998, Holnam submitted a modification request to remove the 99.9% particulate control efficiency requirement for the electrostatic precipitator (ESP) in Section II.A.4 of the permit. The change did not result in an increase in allowable particulate emission rates from the kiln. **Permit #0982-06** replaced Permit #0982-05.

Holnam proposed (in permit application #0982-07) to use 800 tons/year of post-consumer recycled container glass in the kiln and to handle 85,000 tons/year of landfilled cement kiln dust (CKD). Holnam submitted an emission inventory that identified 5.13 pounds/year of emissions of hazardous air pollutants (HAP) being emitted as a result of using post-consumer recycled container glass. Holnam submitted a health risk assessment that demonstrated that this proposal constituted a negligible risk to human health and the environment. In addition, handling 85,000 tons/year of landfilled CKD involved moving landfilled dust from the landfill with a front-end loader to a truck. A small portion of the CKD was sold for use in reclamation projects. Handling the CKD resulted in an emissions increase of approximately 23.8 tons per year of total particulate matter and 11.9 tons/year of PM_{10}. **Permit #0982-07** replaced Permit #0982-06.

On December 7, 1999, Holnam requested a permit modification to correct condition II.B.5, which was intended to limit the use of pozzolan material fed through the pozzolan material system. This was intended to be specific to the pozzolan material storage silo, rotary feeder, weighbelt conveyor, screw line, and bin vent dust collector, and not the entire facility. Also, condition II.E.3 was updated to reflect this correction. **Permit #0982-08** replaced Permit #0982-07.

On August 10, 2000, Holnam submitted a permit application to request federally enforceable permit conditions to limit potential particulate matter emissions. Holnam requested the federally enforceable conditions to ensure that the facility's potential emissions would be within the "area source" definition as defined in the Portland Cement Maximum Achievable Control Technology (PC MACT) standard. Although this permit action could have been accomplished through a permit modification, an alteration was requested by Holnam to allow the public to comment on the permit. De minimis changes were also added to the permit (Department Decision) during the comment period. **Permit #0982-09** replaced Permit #0982-08.

On February 20, 2001, the Department of Environmental Quality (Department) received a letter from Holnam requesting a de minimis change to Permit #0982-09 resulting from the recycling of CKD directly back into the kiln. The Department agreed that emissions from the transfer of CKD would be a de minimis change to Permit #0982-09. Holnam, therefore, was not required to obtain a permit alteration to commence with this project.

On April 6, 2001, Holnam submitted a complete permit application to the Department requesting a change in the fuel mixture to provide additional operational flexibility at the Trident facility. When the application was submitted, Holnam was authorized to burn up to 100% natural gas, up to 100% coal, up to 25% coke, or any combination of these fuels for the kiln, providing the coke limit is not exceeded. The modification of Permit #0982-09 would eliminate any limit on the amount of petroleum coke Holnam used as a fuel in its kiln, would place emissions limits on the amount of SO and NO_x emitted from the kiln and would mandate that Holnam monitor emissions of those pollutants through the use of continuous emissions monitors (CEMs).

Permit #0982-05 allowed Holnam to conduct a temporary test burn that exceeded the operational limit of 25% for petroleum coke at the facility. In November 2000, source testing was performed during the coke test burn to evaluate NO_x and SO_2 emissions as the coke feed exceeded 25%. The amount of emissions from the test burn was restricted to less than 15 tons per year of SO_2 in accordance with ARM 17.8.705(1)(q). Holnam was also required to comply with the sulfur-in-fuel requirements and maintain applicable records during the test. Analysis of the November 2000 source test data, provided by Holnam, suggested that NO_x and SO_2 emissions would not increase as a result of the increase in coke up to approximately 45% coke. However, in order to ensure that NO_x and SO_2 emissions from the kiln would not increase above significant levels, the Department established emission limits for NO_x and SO_2.

On April 11, 2001, Holnam submitted a request to modify preconstruction Permit #0982-09 to change or modify language in the permit. In general, requests included removal of detailed equipment names and facility documentation requirements for pozzolan material, post consumer recycled container glass, and amount of lime kiln dust handled from the "3rd day of each month" to the "10th day of each month." The Department included these changes in Permit #0982-10.

On June 19, 2001, The Sierra Club, Montana's Against Toxic Burning, and the Montana Environmental Information Center appealed Permit #0982-10. The appeal of Permit #0982-10 was dismissed by the Board of Environmental Review (Board) on November 16, 2001, based on a settlement between the petitioners and Holnam, and Permit #0982-10 was issued with modifications on December 04, 2001. **Permit #0982-10** replaced Permit #0982-09.

On November 14, 2001, the Department received written notification that Holnam, Inc. intended to officially change its name to Holcim on December 12, 2001. In a letter dated November 19, 2001, the Department approved the request to transfer under ARM 17.8.734(2) with all of Holcim's applicable permit conditions remaining the same.

D. Current Permit Action

On October 3, 2001, Holcim submitted an application to the Department for a modification to Montana Air Quality Permit #0982-1. The permit application requested that the mid-kiln combustion of whole tires be added to the list of potential fuels for the facility. The tires would comprise up to 15 percent of the total fuel heat input to the kiln on a British thermal unit (Btu) basis. Holcim is currently authorized to burn natural gas, coal, petroleum coke, or any combination of these as a fuel for the kiln. This project would entail some limited modification to the kiln shell and would require additional miscellaneous equipment to handle and store tires at the facility. Since Holcim applied for a solid waste incineration permit under 75-2-215, Montana Code Annotated (MCA), a human health risk assessment was required with the air quality application in accordance with ARM 17.8.770. In addition, analysis by Holcim determined that carbon monoxide (CO) emissions could potentially increase above the Prevention of Significant Deterioration (PSD) significance threshold; therefore, the PSD program applies CO from the project and an emission limit was established for CO. The current permit action also changes the name on the permit from Holnam, Inc. to Holcim. The Department received the request for the name change on November 14, 2001. According to that letter, the change became effective on December 12, 2001. After Holcim's submittal of additional supporting information, the Department deemed the application to be complete on February 12, 2003.

On March 24, 2003, a Preliminary Determination (PD) and draft Environmental Assessment (EA) were issued by the Department. On August 15, 2003, the Department issued a Final EA recommending that an Environmental Impact Statement (EIS) be completed for the project.

The Montana Environmental Policy Act (MEPA) requires that a cumulative impact analysis be conducted before a decision can be made on the permit application. The Department determined that the preparation of an EIS would generate the information necessary to conduct this analysis. Therefore, an EIS was completed for this project. In order to limit emissions and protect Montana's negligible risk standards, emissions limits for CO, volatile organic compounds (VOC), cadmium (Cd), total chromium (Cr), lead (Pb), arsenic (As), beryllium (Be), manganese (Mn), mercury (Hg), dioxins and furans, and total polycyclic aromatic hydrocarbons (PAH) were placed in Permit #0982-11. This permit also requires Holcim to install, operate, calibrate, and maintain a Continuous Opacity Monitoring System (COMS) on the kiln stack and limits the amount of ASARCO slag Holcim can use in the kiln on a rolling 12-month basis.

This supplemental PD contains information gathered during the EIS process and changes made to the permit since the initial PD was issued on March 23, 2003. For example, the supplemental PD requires Holcim to install, operate, calibrate, and maintain a Continuous Opacity Monitoring System (COMS) on the kiln stack and limits the amount of ASARCO slag that may be used in the kiln. All comments submitted on the initial PD have been reviewed by the Department and addressed by the Department in the supplemental PD, as appropriate. Furthermore, the supplemental PD will be attached to the draft EIS and open for public comment.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available, upon request, from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 - General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, MCA.

Holcim shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2 - Ambient Air Quality, including, but not limited to:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.222 Ambient Air Quality Standard for Lead
8. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

Holcim must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 - Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. (1) This rule states that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes. (2) This rule states that no person may cause or authorize emissions to be discharged into an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule states an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate. (2) Under this rule, Holcim shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter Fuel, Burning Equipment. This rule states that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule states that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule states that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth the in this rule.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). Holcim is an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts:

   40 CFR Part 60, Subpart A – The general provisions provided in 40 CFR Part 60 apply to all equipment or facilities subject to any subpart listed below.

   40 CFR Part 60, Subpart F – Standards of Performance for Portland Cement Plants. The provisions of this Subpart are applicable to the following affected facilities in Portland cement plants: kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems. Sources are subject to the requirements of this Subpart if the facility commences construction or modification of that source after August 17, 1971. This subpart shall apply to sources at Holcim, including, but not limited to, the following:

   a. Finish Mill #2
   b. Finish Mill #4
   c. Storage Silos #26 through 30

   Finish Mill #4 replaced Finish Mill #1 in 1988 and the product storage silos were installed in 1976. Since commencement of construction occurred after August 17, 1971, for both of these sources, 40 CFR 60, Subpart F applies. The replacement of the air slide in the Finish Mill #2 system was considered a modification of the Finish Mill #2 system. Since this modification occurred after August 17, 1971, 40 CFR Part 60, Subpart F is applicable to Finish Mill #2.

7. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAPs). The owner and operator of any stationary source or modification, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, as listed below:

   40 CFR Part 63, Subpart A – The general provisions provided in 40 CFR Part 63 apply to all equipment or facilities subject to any subpart listed below.

   40 CFR Part 63, Subpart LLL - NESHAPs for The Portland Cement Manufacturing Industry. The Holcim Trident Plant must comply with all applicable requirements of this Subpart. On October 14, 1999, the Department received initial notification designating the Trident Plant a major source. Holcim completed testing for the facility to determine if emissions of HAPs and hydrochloric acid (HCl) could be used to re-designate the facility as an area source. Holcim tested for VOCs as a surrogate for organic HAPs and HCl. Results of the testing indicated that the facility was an area source for the purposes of determining the applicability of PC MACT. Furthermore, Permit #0982-11 establishes a limit on VOC emissions to limit organic HAPs and assure that Holcim remains an area source. As an area source, the Trident Plant must meet specific limitations including a dioxin and furan emission limit for the kiln.

D. ARM 17.8, Subchapter 5 - Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Holcim submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7 - Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit modification if they construct, alter or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. Holcim has the PTE greater than 25 tons per year of SO_2, NO_x, CO, and PM_{10}; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. Holcim submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Holcim submitted an affidavit of publication of public notice for the October 10, 2001, issue of the *Three Forks Herald*, a newspaper of general circulation in the Town of Three Forks in Gallatin County, as proof of compliance with the public notice requirements. In addition, in accordance with 75-2-215, MCA, Holcim submitted affidavits of publication for the second and third public notices as proof of compliance with the public notice requirements. The notices were published in the *Bozeman Daily Chronicle* on April 18, 2002, and March 20, 2002, in the *Three Forks Herald* on April 10, 2002, and March 27, 2002, in the *Manhattan-Churchill Times* on April 9, 2002, and the *Belgrade High Country Independent Press* on March 21, 2002.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Holcim of the responsibility for complying with any applicable federal or Montana statute, rule or board or court order, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

12. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked, amended, or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which may not be less than 1 year or more than 3 years after the permit is issued.

13. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules adopted by the Board or changes in operation at a source that do not result in an increase of emissions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

16. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, MCA.

F. ARM 17.8, Subchapter 8 - Prevention of Significant Deterioration of Air Quality including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through 17.8.827 shall apply to any major stationary source and any major modification with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

Holcim is a major stationary source because it has a PTE greater than 250 tons per year of a pollutant. This permitting action (#0982-11) will potentially increase CO emissions above the PSD significance threshold of 100 tons per year; therefore, PSD applies to this action. Based on the analysis of the potential increase in CO emissions, the Department established a CO emission limit of 310 tons per year in this permit.

G. ARM 17.8, Subchapter 12 - Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

a. PTE> 100 tons/year of any pollutant.

b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Board may establish by rule.

c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #0982-11 for Holcim, the following conclusions were made.

a. The facility's PTE is greater than 100 tons/year for several pollutants.

b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to a current NSPS (40 CFR 60, Subpart F).

e. This facility is subject to a current NESHAP standard (40 CFR 63, Subpart LLL).

f. This source is not a Title IV affected source, nor a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Holcim is a major source of emissions as defined under Title V. Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. Holcim's operating permit became effective on July 26, 2001.

III. BACT Determination

A BACT determination is required for each new or altered source. Holcim shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.
The Department received comments that Holcim should consider converting the existing wet process kiln to a dry process kiln under the BACT analysis. The conversion of the kiln was not considered in the Department's BACT determination. Holcim's application requested that the mid-kiln combustion of whole tires be added to the list of potential fuels for the existing kiln. Historically, the U.S. Environmental Protection Agency and the Department have not viewed the BACT requirement as a means to re-define the design of the source when considering available control technologies. Converting Holcim's kiln would be re-defining the design of the source; therefore, the Department did not consider it in the BACT analysis. However, through the EIS process, the Department evaluated the impacts of converting the kiln from a wet process to a dry process. The cost to convert the Trident kiln would be approximately $146 million. Considering the potential emissions reductions and the cost for conversion, this option would be eliminated as economically unreasonable, even if considered in the BACT analysis.

The BACT analysis includes add-on controls such as regenerative thermal oxidizers (RTO) and regenerative catalytic oxidizers (RCO) for CO and RTO, RCO, and adsorption for HAP emissions. The Department reviewed the following control options, as well as previous BACT determinations for similar permitted sources in order to make the following pollutant specific BACT determinations. A summary of the analysis of these controls is shown below.

A. CO BACT Analysis

1. Identification of CO Control Strategies/Technologies

a. Oxidation

The process of oxidation breaks down and destroys the CO in the gas stream to form CO_2 and water vapor. Operational variables such as temperature, residence time, and turbulence of the system affect CO control efficiency. Incinerators and oxidizers have the potential for high CO control efficiency; however, this efficiency typically comes at the expense of increasing NO_x production. Furthermore, due to the high temperatures required for complete destruction, fuel costs would be expensive and fuel consumption would be excessive with oxidation units. To lower fuel usage, an RCO or RTO can be used to preheat contaminated process air in a heat recovery chamber.

RCO
Catalytic incineration takes place at temperatures between 600° F and 1,000° F. Typical catalyst systems used include metal oxides such as nickel oxide, copper oxide, manganese oxide, or chromium oxide. Noble metals such as platinum and palladium may also be used.

RTO
Thermal incineration takes place at temperatures between 1,450° F and 1,600° F.

b. Proper Design and Combustion

Reduction of CO would be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at Holcim involves maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes CO formation.

2. Eliminate Technically Infeasible Control Options

RCO is considered technically infeasible and not considered further in the BACT analysis due largely to the sensitivity of the catalyst material. Metal oxide catalysts deactivate from exposure to low levels of SO_2 and sulfur trioxide (SO_3). In addition, noble metal catalysts rapidly deactivate from exposure to particulate found in the kiln exhaust. RCO technology is generally limited to natural gas-fired combustion sources, which have only trace amounts of particulates and sulfur compounds in the flue gas.

3. **Rank Control Technologies by Control Effectiveness**

RTO control efficiency may range from 70 % to 95 %. A control efficiency of 90% was used in the BACT analysis submitted by Holcim.

Control Technology	% Control
RTO	90%
Proper Design and Combustion	--

4. Evaluate Remaining Control Technologies

a. Initially, Holcim provided a capital cost of approximately $3.6 million for an RTO to reduce CO emission levels from the kiln. Estimated annual operating costs were approximately $1.7 million for an RTO with a cost effectiveness of approximately $6,096 per ton. The BACT analysis was conducted in accordance with information from the Office of Air Quality Planning and Standards Cost Control Manual, 5th Edition, February 1996 (OAQPS Manual). Additional research conducted by Holcim revealed that there would be additional equipment cost incurred to pre-treat the kiln exhaust gas to reduce concentrations of SO_2 and particulate (i.e., a wet scrubber located upstream of the RTO). An RTO requires relatively low concentrations of SO_2 and particulate to function efficiently otherwise there will be considerable fouling and plugging of the RTO (RTO technology is normally used with a gas stream that contains very little particulate matter). Some metals and/or heavy dust loading deactivates the catalyst, reduces heat recovery efficiency, and shortens the catalyst replacement interval; thereby, reducing the availability of the RTO for the kiln. Installation and operation of the wet scrubber could also increase NO_x emissions at the facility. Including the additional costs associated with scrubber control, Holcim provided a capital cost of approximately $6.5 million for RTO to reduce CO emission levels from the kiln. With the annual operating costs of approximately $1.98 million for the RTO and an additional cost of $1.23 million for the scrubber, the cost effectiveness increased from approximately $6,096 per ton (without additional scrubber control) to $12,484 per ton.

b. An RTO can result in additional energy and environmental concerns such as: a potential increase in the amount of fuel used to increase gas temperatures; potential NO_x emissions increases; and the potential disposal of toxic spent catalyst.

Overall, the cost effectiveness of this technology is greater than industry norms, there are additional energy and environmental impacts associated with this technology, and based on a search of the EPA RACT/BACT/LAER Clearinghouse, no add-on BACT control for CO has been required previously on a cement kiln. For these reasons, RTO does not constitute BACT for this project.

5. Select CO BACT

a. Proper Design and Combustion

Reduction of CO would be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at Holcim involves maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes CO formation. Therefore, the Department determined that proper design and combustion constitutes BACT for CO. However, since PSD applies to this permit action, the Department established a CO limitation of 310 tons per year (based on a rolling 12-month time period).

B. HAPs BACT Analysis

1. Identification of HAP Control Strategies/Technologies

a. Oxidation

Similar to CO, the general process of oxidation breaks down and destroys organic compounds (i.e., HAP) in the gas stream to form CO_2 and water vapor. In a cement kiln, operational variables such as temperature, residence time, and turbulence affect HAP control efficiency. The two potential methods of incineration to control HAP emissions are direct thermal oxidation and catalytic oxidation. Incinerators/oxidizers have the potential for high HAP control efficiency (up to 99%); however, this efficiency typically comes at the expense of increasing NO_x production. As a result of the high temperatures required for complete destruction, fuel costs can be high and fuel consumption can be considerable with oxidation units. To lower fuel usage, a RTO or RCO can be used to preheat contaminated process air in a heat recovery chamber. Although cement kiln temperatures are generally greater than the temperatures required for RCO and RTO, the exhaust gas would need to be routed through the ESP to prevent fouling and damaging of the oxidation unit. As the exhaust gas exits the ESP, the temperature would be approximately 325° F and additional fuel would be required to reheat the exhaust gas stream prior to entering the RTO or RCO.

<u>RCO</u>
Catalytic incineration takes place at temperatures between 600° F and 1,000° F. Typical catalyst systems used include metal oxides such as nickel oxide, copper oxide, manganese oxide, or chromium oxide. Noble metals such as platinum and palladium may also be used.

<u>RTO</u>
Thermal incineration takes place at temperatures between 1,450° F and 1,600° F.

b. Adsorption

Adsorption is not a pollutant destruction method, but rather a concentration technology used to remove gaseous pollutants from low to medium concentration gas streams. Adsorption systems collect gaseous pollutants onto an adsorbent media with a large internal surface area. Common adsorbents include activated carbon, silica gel, activated alumina, synthetic zeolites, fuller's earth, and other clays. Adsorptive capacity of the solid for the gas tends to increase with the gas phase concentration, molecular weight, diffusivity, polarity, and boiling point. The adsorbed pollutants are then concentrated using thermal desorption and oxidized either on-site or by a separate contractor. The adsorption system evaluated by Holcim consisted of three carbon beds with two beds available for adsorbing and the third available for desorbing or on standby.

c. Proper Design and Combustion and Existing Particulate Control

Reduction of HAP emissions in the kiln would be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at Holcim involves maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes HAP formation. Furthermore, existing particulate control devices provide control of the HAP emissions (arsenic, cadmium, beryllium, chromium, manganese, lead, mercury, etc.) that are emitted as particulate.

2. Eliminate Technically Infeasible Control Options

Although technical complications exist for all post-kiln HAP control methods, RCO was the only technology eliminated as technically infeasible and not further considered in the BACT analysis. RCO is considered technically infeasible due largely to the sensitivity of the catalyst material. Metal oxide catalysts deactivate from exposure to low levels of SO_2 and sulfur trioxide (SO_3). Where as, noble metal catalysts rapidly deactivate from exposure to particulate found in the kiln exhaust. RCO technology is generally limited to natural gas-fired combustion sources, which have trace amounts of particulates and sulfur compounds in the flue gas.

3. Rank Control Technologies by Control Effectiveness

The control efficiency for an RTO or an adsorption system would be approximately 99%. The total gaseous HAP emission rate was estimated at 7.4 tons per year; therefore, a total of 7.3 tons could be removed.

Control Technology	% Control
RTO	99%
Adsorption	99%
Proper Design and Combustion and Existing Particulate Control	--

4. Evaluate Remaining Control Technologies

a. RTO technology would not likely be used exclusively for a cement kiln because the catalyst would be rapidly deactivated from the exposure to low levels of SO_2 and SO_3. In addition, a platinum/rhodium-based catalyst would also be rapidly deactivated by particulate emissions in the exhaust gas. An RTO would have a capital cost of

approximately $3.6 million and annual operating costs of approximately $1.9 million for the RTO which equates to a cost effectiveness of approximately $253,191 per ton.

Using RTO technology would result in additional potential environmental and energy concerns such as the additional fuel used to increase gas temperatures and the disposal of spent catalysts which are potentially toxic and subject to RCRA waste disposal regulations.

b. An Adsorption system would have a capital cost of approximately $659,224 for a carbon adsorption system and annual operating costs of approximately $410,870. Cost effectiveness for the system would be approximately $56,284 per ton.

Additional potential environmental and energy impacts could include additional energy required for pressure drop and steam production and the disposal of spent carbon.

Overall, the cost of both the RTO and adsorption technologies is greater than industry norms, there are additional energy and environmental impacts associated with these technologies, and based on a search of the EPA RACT/BACT/LAER Clearinghouse, no add-on BACT control for HAP emissions has been required on a cement kiln. For these reasons, RTO and adsorption do not constitute BACT for this project.

5. Select HAP BACT

Existing Particulate Control and Proper Design and Combustion

Reduction of HAP emissions in the kiln would be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practices at Holcim involve maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes HAP formation. Furthermore, existing particulate control devices provide control of HAP emissions (arsenic, cadmium, beryllium, chromium, manganese, lead, mercury, etc.) that are emitted as particulate. Therefore, the Department determined that proper design and combustion and the use of existing particulate control equipment would constitute BACT for HAP emissions. Based on the analysis done for 75-2-215, MCA and ARM 17.7.770, the Department also determined that the following emission limitations would demonstrate compliance with the negligible risk standard, limit HAP emissions, and constitute BACT for this project:

Pollutant	Emission Limit
PM	0.77 lb/ton of clinker
VOC	2.25 lb/hr
As	7.15×10^{-5} lb/hr
Be	8.17×10^{-6} lb/hr
Ca	5.01×10^{-4} lb/hr
Cr (total)	1.09×10^{-5} lb/hr
Pb	4.68×10^{-3} lb/hr
Mn	3.16×10^{-2} lb/hr
Hg	3.99×10^{-3} lb/hr
PAH (total)	1.89×10^{-2} lb/hr

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. 8Emission Inventory Summary

A. Potential CO Kiln Emissions Increase from burning whole tires:

Criteria Pollutant	Potential Emission Rate (lb/hr)	Potential Emissions (ton/year)
CO	43.15	189

Note: Maximum clinker production is 425,000 tons per 12-month period.
Continuous operation is assumed to be 8760 hours per year.

Since the potential CO emissions increase may be greater than the PSD significance threshold, the PSD program applies and the Department established a CO limit 310 tons per year.

B. Potential Criteria Pollutant Emissions from the Kiln including whole tires:

Pollutant	Emission Rates			
	lb/ton clinker	Lb/hr	g/sec	Tpy
PM_{10}	0.77	37.4	4.71	164
SO_2	2.55	124	15.6	543
NO_x	32.31	1,568	197.6	6,868
CO	1.46	70.8	8.92	310
VOC	0.046	2.25	0.283	9.86
Lead	0.0003	0.0147	0.0018	0.06

Note: Maximum clinker production is 425,000 tons per 12-month period. Continuous operation is assumed to be 8760 hours per year.

A complete particulate emissions inventory for the Trident facility is available, upon request, from the Department or available in Permit #0982-09.

C. Potential HAP Emissions from the Kiln including the addition of whole tires:

Pollutant	Baseline Emissions[a] (lb/hr)	Emissions from tires[b] (lb/hr)	Total[c] (lb/hr)	Total[c] (ton/yr)
As	2.26×10^{-4}	7.15×10^{-5}	2.98×10^{-4}	1.30×10^{-3}
Be	2.41×10^{-5}	8.17×10^{-6}	3.23×10^{-5}	1.41×10^{-4}
Ca	3.08×10^{-4}	5.01×10^{-4}	8.09×10^{-4}	3.54×10^{-3}
Cr (total)	1.22×10^{-3}	1.09×10^{-5}	1.23×10^{-3}	5.39×10^{-3}
Pb	9.98×10^{-3}	4.68×10^{-3}	1.47×10^{-2}	6.44×10^{-2}
Mn	3.40×10^{-3}	3.16×10^{-2}	3.50×10^{-2}	1.53×10^{-1}
Hg	3.54×10^{-3}	3.99×10^{-3}	7.53×10^{-3}	3.30×10^{-2}
PAH (total)	2.64×10^{-2}	1.89×10^{-2}	4.53×10^{-2}	1.98×10^{-1}

Note: Emissions based on maximum clinker production of 425,000 tons per 12-month period. Continuous operation is assumed to be 8760 hours per year.
a: Baseline emissions established from Trident source test data
b: Emission limit from Section II.C.3 of this Permit
c: Baseline emissions plus emissions from tires

V. Existing Air Quality

Holcim's Trident facility is located in the Northeast ¼ of Section 9, Southeast ¼ of Section 4, Southwest ¼ of Section 3, and Northwest ¼ of Section 10, Township 2 North, Range 2 East, approximately 5 miles northeast of Three Forks in Gallatin County, Montana.

Holcim submitted air dispersion modeling to predict the impacts of tire burning on ambient concentrations of criteria pollutants. Modeling of the Trident plant was performed using the most current version of EPA's AERMOD modeling system (version 03273). The modeling results were reviewed by the Department and demonstrated compliance with the National Ambient Air Quality Standards (NAAQS) and the Montana Ambient Air Quality Standards (MAAQS) for all criteria pollutants. The peak modeled impacts occur at or near the Holcim property boundary,

and modeled impacts drop off with distance from the source. Background concentration values were provided by DEQ. Complete results of the compliance modeling are listed in the table below.

Demonstration of Compliance with NAAQS and MAAQS

Pollutant	Avg. Period	Holcim Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	TOTAL Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)
NO_2	Annual	43.5[b]	6	**49.5**	100	94
	1-hour	329[b]	75	**404**	---	564[a]
SO_2	Annual	5	3	**8**	80	52
	24-hour	26	11	**37**	365[a]	262[a]
	3-hour	74	26	**100**	1,300[a]	---
	1-hour	130	35	**165**	---	1,300[c]
CO	8-hour	27	1,150	**1,177**	10,000[a]	26,450[a]
	1-hour	113	1,725	**1,838**	40,000[a]	10,350[a]
PM_{10}	Annual	1	8	**9**	50	50
	24-hour	8	30	**38**	150[a]	150[a]
O_3 (as VOC)	1-hour	2	N/A	**2**	235	196[a]
Lead	Quarter	0.033[d]	N/A	**0.033**[d]	1.5	---
	90-day	0.033[d]	N/A	**0.033**[d]	---	1.5

[a] Not to be exceeded more than once per year.
[b] These values obtained with the ozone limiting method procedure.
[c] Not to be exceeded more than 18 times in 12 months.
[d] Tenth high modeled 1-hour value used for conservative comparison with standard.

In addition to criteria pollutants, the potential impacts from hazardous air pollutants (i.e. constituents of potential concern (COPC)) for the proposed project were addressed in the EIS performed for this project. Conditions and limitations contained in Permit #0982-11 protect Montana's negligible risk standard. Therefore, the proposed project would not be expected to result in an excess lifetime cancer risk that exceeds 1.0×10^{-6} for any individual pollutant, or 1.0×10^{-5} for the aggregate of all pollutants.

VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VII. Environmental Assessment

An EIS was completed for this project.

Permit Analysis Prepared By: Carson Coate
Date: March 16, 2006